



PATENT  
Customer No. 22,852  
Attorney Docket No.: 3549.0088-0100

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: )  
William C. COX et al. ) Group Art Unit: 1771  
Serial No.: 10/687,814 ) Examiner: Ula C. RUDDOCK  
Filed: October 20, 2003 ) Confirmation No.: 2634  
For: CHEMICAL RESISTANT, WATER AND )  
DRY PARTICLE IMPERVIOUS, FLAME )  
RESISTANT LAMINATE )

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**DECLARATION UNDER 37 C.F.R. § 1.131**

We, William C. Cox ("Carey Cox") and Philip E. Harris, state that we are the named co-applicants of the above-identified application and the joint inventors of the subject matter described and claimed therein. The present application has a filing date of October 30, 2003. The present application claims priority as a continuation of U.S. Application No. 09/294,056 (filed April 19, 1999), which claims priority to U.S. Provisional Application No. 60/082,330 (filed April 20, 1998). We declare as follows:

1. We have reviewed the pending claims in this application. A copy of the pending claims is attached as Exhibit 1.
2. We have been advised that the United States Patent & Trademark Office (USPTO), in an Office Action dated October 20, 2004, rejected all claims of the above-identified application as obvious over U.S. Patent No. 5,491,022 to Smith in view of U.S.

Patent No. 6,265,082 to Dunham et al. ("Dunham"). Dunham has a filing date of April 9, 1999 and claims priority to a provisional application, filed on April 9, 1998.

3. Prior to April 9, 1998, we reduced to practice the invention described and claimed in the above-identified application. That reduction to practice occurred in the United States. In particular, we produced a laminate within independent claims 1 and 25. The laminate we produced was made of a layer of non-woven fabric with a fire retardant additive applied thereto and a layer of polyvinyl chloride film joined together by an adhesive, wherein the laminate had an overall thickness between 0.013 and 0.014 inches. Evidence of this laminate may be found in the documents attached as Exhibit 2.

4. The documents reproduced as Exhibit 2 were written and prepared by Precision Fabrics Group employees (Carey Cox, and a laboratory-laminating-line technician, whom Philip Harris supervised and directed in this project). Exhibit 2 is a true and accurate copy of pages 33 and 35 from notebook 128 kept by Carey Cox with the dates redacted. The documents reproduced as Exhibit 2 were prepared by Carey Cox prior to April 9, 1998.

5. Prior to April 9, 1998, a technician under Philip Harris's supervision operated the laboratory laminating line with raw materials and at process conditions that Carey Cox and Philip Harris selected. See Exh. 2, laboratory notebook 128, page 33.

6. The first layer of the above-identified laminate was a "FR Finished Spunlace," identified by an internal Precision Fabrics Group style number of 043-08830. The "FR" stands for fire resistant, and the particular fire resistant additive applied to the spunlace fabric was finish number 043. A spunlace fabric is a non-woven fabric. This information is in the raw material section under "primary." Id.

7. The second layer of the above-identified laminate was a 0.4 mil blown film comprising polyvinyl chloride ("PVC"). This information is in the raw material section under "secondary." Id.

8. The two layers were joined together with an adhesive. The adhesive was labeled "EXP 500-030." This information is in the raw material section under "adhesive." Id.

9. On page 35 of Exhibit 2, Lab Line Lamination Results are given for a laminate identified as Material: 043 – 8830 // EXP 500-030 (0.4 MIL BLOWN PVC), which corresponds to the laminate described in paragraphs 6-8 above. See the third box on page 35 of notebook 128. The thickness of two samples of the above-identified laminate averaged 0.0135 inches. While the thickness column is labeled as "(mils)" (a mil is a thousandth (0.001) of an inch), the measurement is, in fact, in inches.

10. Accordingly, we have shown reduction to practice of the invention claimed in at least independent claims 1 and 25 prior to April 9, 1998.

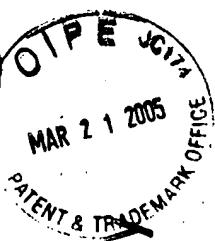
We declare, further, that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further, that the statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patents issuing thereon.

Respectfully submitted,

Full Name of First Inventor William C. Cox	Inventor's Signature <i>William C. Cox</i>	Date 3-21-05
Full Name of Second Inventor Philip E. Harris	Inventor's Signature <i>Philip E. Harris</i>	Date 3/21/05

PENDING CLAIMS AS OF 3/21/05

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1. (Previously Presented) A laminate comprising:
  - (a) a first layer of a nonwoven fabric having a fire retardant additive applied thereto; and
  - (b) a second single layer containing a halogenated flame resistant polymeric film, wherein the film consists of one of polyvinyl chloride, polyvinyl bromide, and polyvinylidene chloride,  
wherein the laminate passes NFPA 701-1989, has at least 12.0 lbs of grab tensile according to INDA IST 110.3-92, and has a Suter hydrostatic head of at least 50 cm.

Claims 2-5 (Canceled)

6. (Previously Presented) The laminate of claim 1, wherein the laminate has a thickness ranging from about 0.001 to about 0.5 inches.
7. (Previously Presented) The laminate of claim 1, wherein the first and second layers are joined together by an adhesive.
8. (Previously Presented) The laminate of claim 1, wherein the first and second layers are joined together by at least one of ultrasonic lamination, R.F. sealing, adhesive lamination, and heat bonding with pressure.
9. (Original) The laminate of claim 1, wherein the polymeric film is halogenated.
10. (Original) The laminate of claim 1, wherein the polymeric film comprises polyvinyl chloride.

11. (Original) The laminate of claim 1, wherein the polymeric film has a thickness ranging from about 0.3 to about 8.0 mils.

12. (Previously Presented) The laminate of claim 1, wherein the fire retardant additive comprises at least one of ammonium polyphosphate, ammonium dihydrogen phosphate, urea polyammonium phosphate, antimony trioxide, sodium antimonate, zinc borate, a zirconium oxide, a molybdenum oxide, a zirconium sulfide, and a molybdenum sulfide.

13. (Previously Presented) The laminate of claim 1, wherein the fire retardant additive comprises at least one of a chlorinated paraffin, tetrabromobisphenol-A, decabromodiphenyl oxide, hexabromodiphenyl oxide, pentabromobiphenyl oxide, pentabromotoluene, pentabromoethylbenzene, hexabromobenzene, pentabromophenol, tribromophenol derivatives, perchloropentanecyclodecane, hexabromocyclododecane, tris(2,3-dibromopropyl-1)isocyanurate, tetrabromobisphenol-S, 1,2-bis(2,3,4,5,6-pentabromophenoxy)ethane, 1,2-bis(2,4,6-tribromophenoxy)ethane, a brominated styrene oligomer, 2,2-bis-(4(2,3-dibromopropyl)-3,5-dibromophenoxy)propane, tetrachlorophthalic anhydride, and tetrabromophthalic anhydride.

14. (Original) The laminate of claim 1, wherein the fire retardant additive is applied to the first layer at about 5 to about 45 percent by weight of the first layer.

**Claim 15 (Canceled)**

16. (Original) A protective garment formed of the laminate of claim 1.

Claims 17-23 (Cancelled)

24. (Cancelled) The laminate of claim 1, further comprising:  
a third layer of a polyethylene film.
25. (Previously Presented) A laminate comprising:  
a first layer of a nonwoven fabric having a fire retardant additive applied thereto; and  
a second layer of a halogenated polymeric film, wherein the laminate has a total thickness ranging from about 0.005 to about 0.05 inches.
26. (Previously Presented) The laminate of claim 25, wherein the laminate passes NFPA 701-1989, has at least 12.0 lbs of grab tensile according to INDA IST 110.3-92, and has a Suter hydrostatic head of at least 50 cm.
27. (Previously Presented) The laminate of claim 25, wherein the nonwoven fabric comprises cellulose fibers and manmade fibers.
28. (Previously Presented) The laminate of claim 25, wherein the nonwoven fabric has a weight ranging from 1.0 to 4.0 ounces per square yard.
29. (Previously Presented) The laminate of claim 25, wherein the halogenated polymeric film comprises polyvinyl chloride.
30. (Previously Presented) The laminate of claim 25, wherein the halogenated polymeric film has a weight ranging from 0.05 to 10.0 ounces per square yard.
31. (Previously Presented) The laminate of claim 25, further comprising a third layer of a polymeric film.

32. (Previously Presented) The laminate of claim 31, wherein the polymeric film of the third layer comprises a polymeric film dissimilar to the halogenated polymeric film of the second layer.

33. (Previously Presented) The laminate of claim 31, wherein the polymeric film of the third layer comprises ethylene vinyl alcohol.

**TITLE** CR/FK Page 32  
Work continued from Page 32

PROJECT NO. DR #2057

33

Work continued from Page 3

BOOK NO. /28

## **Best Available Copy**

## CR/FR Concept; Lab Link Process - sheet

043-08830 // EXP 500-030 // 0.4m. / Blown  
PVC

**LAB LINE LAMINATION REQUEST**

TO: OSCAR PHILLIPS                    REQUEST DATE: \_\_\_\_\_  
FROM: PHIL HARRIS                    NEED BY: \_\_\_\_\_  
REQUEST DESCRIPTION: \_\_\_\_\_            CC: RANDY MITCHELL  
    ERIC FROST  
    CASEY COX  
DR #: 2057                            OBJECTIVE: PRODUCE CR. FR. PROTECTIVE APPAREL CONCEPT SAMPLES.

**SPECIAL INSTRUCTIONS:** FORWARD FINISHED LAMINATES TO CARRY COX FOR CRF TESTING.

**END USE: PROTECTIVE APPAREL**

PAGE: 1 OF 1

**PROCESS INFORMATION:**

RAW MATERIALS	PRIMARY	SECONDARY	ADHESIVE
PFO STYLE	043-08830	NA	NA
VENOR STYLE	N/A	NA	EXP 100-030
DESCRIPTION	FR FINISHED SPUNLACE	0.4 MIL BLOWN FILM	FLAME RESISTANT PUR
VENDOR	PFO	REYNOLDS	NOWAT
COLOR	BLUE	NATURAL	NATURAL
COMPOSITION	WCOD PULP/PET	PVC	PUR
SOLID WEIGHT(OZ/SY)	2.30	0.72	TBD
WIDTH (IN.)	SWATCHES	11.625	12
ADHESIVE TO	WOOD PULP	EITHER SIDE	N/A

#### **PROCESS CONDITIONS**

PROCESS CONDITIONS		ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL
SAMPLE ID #	FA0001	100-70				
LINe SPEED (fpm)	90					
COATING WIDTH (in)	12					
ADD-ON (mm)	6					
PUMP RATE (%)	30					
MELT TEMPS (F) TANK	155-245					
ROSE	155-245					
HEAD 1 // 2	140-245					
HEAD POS. Backup (mm)	72					
X (mm) OFF/DRIVE SIDE	36/36					
Y (exit holes)	23					
Z (mm)	80					
PRIMARY TENSION (mm)	10					
SECONDARY TENSION (%)	40					
WINDER TENSION (0-100)	50					
LAMINATING POINT	NP					
LAMINATING PRESS (psi)	100					
LAM BACKSTOP(mm, cm/s)	N/A					
E TEMP (F / set 1600)	OFF					
SPREADER WRAP ANGLE	N/A					
YARDAGE PER SAMPLE	BWATERS					
PRIMARY ROLL OD (in)	REPORT DENTAL CD					
SECONDARY ROLL OD (in)	REPORT DENTAL CD					
IR LOCATION	NP					

TECHNICIAN: INMP  
RUN DATE: 2-6-97  
NOTES:

**NOTES:**

**NOTES:**

Work continued to Page 34

**SIGNATURE**

<sup>E</sup> W. Corey Cox

DATE

DISCLOSED TO AND UNDERSTOOD BY

DATE

**WITNESS**

DATE

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④ Physical results of all samples produced with  
 Towat 15% FR EXP 500-030 Moisture Cure  
 PUR Adhesive.

DR2057  
 Objective: Produce CR/FR Protective Apparel Concept Samples  
 File A2:DR2057-J  
 Finished Analysis  
 Compiled By: Patel, Shital J.

Date: Feb. 11, 1997  
 Fabric: 043 - 08830  
 Adhesive: EXP 500-030  
 Chemist: Carey Cox

## Lab Line Lamination Results:

Material: 043 - 08830 // EXP 500-030								
Sample 150068 Number(s)	Basis WL (oz/yd <sup>2</sup> )	HOM MD (grams)	HOM XD (grams)	Thickness (mils)	Grab MD (lb.)	Grab XD (lb.)	Flammability NFPA 701 MD (inch.)	Flammability NFPA 701 XD (inch.)
1	2.45	55.8	22.5	0.015	34.4	23.4	4.93	3.93
2	2.61	55.2	16.3	0.015	37.6	23.2	4.50	3.93
Final Avg.	2.55	55.50	19.40	0.0150	36.00	23.30	4.72	3.93

Material: 043 - 08830 // PT-910B (1.5 MIL. FR URETHANE FILM)								
Sample 150069 Number(s)	Basis WL (oz/yd <sup>2</sup> )	HOM MD (grams)	HOM XD (grams)	Thickness (mils)	Grab MD (lb.)	Grab XD (lb.)	Flammability NFPA 701 MD (inch.)	Flammability NFPA 701 XD (inch.)
1							Fail	Fail
2							Fail	Fail
Final Avg.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Material: 043 - 08830 // EXP 500-030 (0.4 MIL. BLOWN PVC)								
Sample 150070 Number(s)	Basis WL (oz/yd <sup>2</sup> )	HOM MD (grams)	HOM XD (grams)	Thickness (mils)	Grab MD (lb.)	Grab XD (lb.)	Flammability NFPA 701 MD (inch.)	Flammability NFPA 701 XD (inch.)
1	2.83	48.8	22.7	0.013	33.60	27.2	4.18	5.00
2	2.86	41.4	28.1	0.014	35.10	24.4	4.00	4.50
Final Avg.	2.85	45.10	25.40	0.0135	34.35	25.80	4.09	4.75

Material: 043 - 08830 // EXP 500-030 (2 MIL. BLOWN PVC)								
Sample 150071 Number(s)	Basis WL (oz/yd <sup>2</sup> )	HOM MD (grams)	HOM XD (grams)	Thickness (mils)	Grab MD (lb.)	Grab XD (lb.)	Flammability NFPA 701 MD (inch.)	Flammability NFPA 701 XD (inch.)
1	4.21	98.0	38.6	0.015	45.7	38.2	5.50	4.5
2	4.32	96.6	86.4	0.015	53.0	43.4	5.25	5.5
Final Avg.	4.27	97.30	87.50	0.0150	49.35	40.80	5.38	5.00

SIGNATURE

W. Carey Cox

DATE

DISCLOSED TO AND UNDERSTOOD BY

Allen Leonard

DATE

DATE

WITNESS